

2001 Conference on Unburned Carbon on Utility Fly Ash

Clean Power From Coal



Pittsburgh Marriott City Center
Pittsburgh, Pennsylvania
May 15-16, 2001

Sponsored by:

U.S. Department of Energy
Office of Fossil Energy
National Energy Technology Laboratory





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National Energy Technology Laboratory



Dear Colleague:

Welcome to the 2001 Conference on Unburned Carbon on Utility Fly Ash. The topic of this Conference is still one of the major technical-regulatory-economic issues in the combustion of coal for power generation. Unburned carbon on fly ash is an undesirable by-product of combustion modification for nitrogen oxides (NO_x) reduction.

Numerous laboratory and pilot plant scale NO_x control technologies are being developed worldwide. *Environmental Protection Magazine* asserts that NO_x reduction at power plants is the final frontier for plant optimization software. Jeffrey Smith, Executive Director of the Institute of Clean Air Companies and a keynote speaker at our back-to-back SCR/SNCR Conference, has said that NO_x has become the pollutant of the millennium.

Atmospheric NO_x appears to be responding to control measures. The U.S. Environmental Protection Agency (EPA) noted a 10 percent decrease in atmospheric NO_x over the last 10 years in its annual Air Trends Report in August 2000. The 2000 Progress Report of the United States/Canada Air Quality Agreement forecasts U.S. NO_x emissions to fall from 23 million metric tons in 1998 to 17 million metric tons by 2010.

Following two important NO_x related regulatory court decisions in 1999 and 2000 that were favorable to the EPA, the Supreme Court in February of this year unanimously upheld the EPA's authority to set (lower) ozone and particulate matter standards (National Ambient Air Quality Standards) without regard to costs. This ruling serves to tighten regulatory authority for NO_x reduction regulations. Further, the Supreme Court in early March upheld the EPA's SIP Call of September 1998, allocating NO_x emission limits to 19 States and the District of Columbia. Thus the 20 jurisdictions have until May 31, 2004 to submit their SIPs. The regulatory driver is still forcing technology to keep up.

The Conference on Unburned Carbon on Utility Fly Ash remains a major focus in dealing with these challenges, and its value as a technology bellwether should only increase. I invite you to participate fully in the discussions generated during this Conference.

Thomas A. Sarkus
Conference Chair

AGENDA

TUESDAY, MAY 15, 2001 - GRAND BALLROOM

7:00 a.m. **Registration/Continental Breakfast**

7:45 a.m. **Introduction**

Thomas A. Sarkus, Conference Chair
Director, Coal Power Products Division
U.S. Department of Energy, National Energy Technology Laboratory

8:00 a.m. **Keynote Address:** "Coal Utilization in the 21st Century"

Robert A. Beck, Executive Director
The National Coal Council, Inc.

Moderator: John Stencel, *Center for Applied Energy Research, University of Kentucky*

REGULATORY OVERVIEW

8:30 a.m. Recent Environmental Regulation of Coal Combustion Wastes

Donald C. Bluedorn II, *Babst, Calland, Clements & Zomnir, P.C.*

EXPERIENCES & OBSERVATIONS

9:00 a.m. Carbon Burn-Out, Commercialization and Experience Update

James G. Keppeler, *Progress Materials, Inc.*

9:30 a.m. Assessment of the Commercial Utilization of Activated Carbons Produced from High Carbon Fly Ashes

M. Mercedes Maroto-Valer, John M. Andrésen, Zhe Lu, Yinzhi Zhang,
Akhnuwkh Jones, Joel L. Morrison, and Harold H. Schobert
The Energy Institute, The Pennsylvania State University

10:00 a.m. **Break**

CONTROL MEASURES

10:30 a.m. Use of Improved Combustion Technology to Reduce Unburned Carbon

John Ralston and Edwin Haddad, *Mobotec USA*

11:00 a.m. Minimization of Carbon Loss in Coal Reburning

Vladimir M. Zamansky, Vitali V. Lissianski and Peter M. Maly
GE Energy and Environmental Research Corporation

11:30 a.m. Reducing Unburned Carbon in Fly Ash from Cyclone Boilers

Stephen A. Johnson, and John P. Comer, *ADA-ES*
John Meinders, *Kansas City Board of Public Utilities*

12:00 Noon **Lunch (on your own)**

Moderator: Mercedes Maroto-Valer, *The Energy Institute, The Pennsylvania State University*

1:30 p.m. On-Line Measurement of Pulverized Coal

David J. Earley, *Air Monitor Corporation*
Presenter: John Thompson, *Air Monitor Corporation*

2:00 p.m. Pilot-Scale Testing of a Vibrating Electrostatic Separator for Fly Ash Decarbonization

Roe-Hoan Yoon, and Eric Yan, *Minerals and Coal Technologies, Inc.*
Oh-Hyung Han, *Chosun University*
Byung-Wook Park, *Korea Flyash Cement Company*

PREDICTIVE PERFORMANCE TOOLS

2:30 p.m. Real Time Carbon in Ash for Optimized Control

Paul Thulen, *ABB Automation*

TUESDAY, MAY 15, 2001 (CONTINUED)

- 3:00 p.m. **Break**
- 3:30 p.m. The Role of Unburned Carbon in AEA Adsorption as Measured by Foam Index and UV-VIS Methods
John P. Baltrus, *U.S. Department of Energy, National Energy Technology Laboratory*
Robert B. LaCount, *Waynesburg College*
Douglas G. Kern, *ViRoLac Industries*
- 4:00 p.m. Experience Using a CAMRAC On-Line UBC Analyzer to Help Improve Combustion
Stephen A. Johnson, and John P. Comer, *ADA-ES*
Charles Lockert, *Solvera Particulate Controls*
- 4:30 p.m. **Adjourn**
- 5:00 p.m.- 6:30 p.m. **Poster Session and Reception - GRAND BALLROOM FOYER**
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WEDNESDAY, MAY 16, 2001 - GRAND BALLROOM

- 7:00 a.m. **Registration/Continental Breakfast**
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PROCESSING & UTILIZATION OF HIGH-LOI FLY ASH

- Moderator:** John Baltrus, *U.S. Department of Energy, National Energy Technology Laboratory*
- 8:00 a.m. Cenosphere Separation from Fly Ash Using Pneumatic Transport, Triboelectric Processing
Tapiwa Z. Gurupira, Charles L. Jones, and John M. Stencel
Center for Applied Energy Research, University of Kentucky
- 8:30 a.m. Commercialization Status of a Pneumatic Transport, Triboelectrostatic System for Carbon/Ash Separation
Charles Lockert, *Solvera Controls/Stock Equipment Company*
Robert Lister, *Boral Material Technologies, Inc.*
John M. Stencel, *Tribo Flow Separations*
- 9:00 a.m. STI's Commercial Beneficiation of High LOI Fly Ash
James T. Bittner, and Stephen A. Gasiorowski, *Separation Technologies, Inc.*
- 9:30 a.m. Bottom Ash Post-Combustion in an Innovative Dry Extraction System at Megalopolis Power Plant, Unit # 3
Alberto Carrea, *Magaldi Ricerche e Brevetti S.r.l.*
Mario Graziadio, *ENEL DSR*
Presenter: *Freddy Cegema, Magaldi Ricerche e Brevetti S.r.l.*
- 10:00 a.m. **Break**
- 10:30 a.m. Use of High-Carbon Fly Ash in the Production of Cellular Lightweight Concrete
Caijun Shi, *Advanced Materials Technologies, L.L.C. & CJS Technology, Inc.*
Yanzhong (Tom) Wu, *CJS Technology, Inc.*
Monte Riefler, *Advanced Materials Technologies, L.L.C.*
- 11:00 a.m. A Commercial Demonstration on the Use of High-Carbon Fly Ash in Cement Manufacture
Javed I. Bhatti, John Gajda, and F.M. Miller, *Construction Technology Laboratories, Inc.*
- 11:30 a.m. **Closing Remarks**
Thomas A. Sarkus, Conference Chair
Director, Coal Power Products Division
U.S. Department of Energy, National Energy Technology Laboratory
- 11:45 a.m. **Close**

POSTER PRESENTATIONS

In-situ Coal Ash Modification to a Cementitious Clinker

Klaus H. Oehr, *Global New Energy (Canada) Inc.*

Tarun R. Naik, *UWM Center By-Products Utilization, University of Wisconsin-Milwaukee*

Control of Coal Flow Distribution from Coal Pipe Splitters

Edward K. Levy, Ali Yilmaz, Harun Bilirgen, Jun Wang, and Xuefeng Shi

Energy Research Center, Lehigh University

Presenter: John Sale

The Influence of Unburned Carbon on the Filtration Performance of a Ceramic Filter

J-H Choi, J-J Ahn, and S-J Ha, *Dept. of Chem. Eng., Gyeongsang National University*

Y-O Park, *Energy & Envir. Research Department, Korea Institute of Energy Research*

Technique for Determining the Potential Recovery of Carbon from Flyash

Paul H. Zandhuis, and Michael V. Ciocco, *Parsons Project Services, Inc.*

Richard P. Killmeyer, McMahan L. Gray, and Yee Soong,

U.S. Department of Energy, National Energy Technology Laboratory

Preparation of SCR Catalytic Filter Supported on a Filter Candle

J-H Choi, S-K Kim, and S-J Ha, *Dept. Of Chem. Eng., Gyeongsang National University*

Y-O Park, *Energy & Envir. Research Department, Korea Institute of Energy Research*

Fly Ash Carbons Separated by Various Cleaning Processes

McMahan L. Gray, Kenneth J. Champagne, Yee Soong, and Richard P. Killmeyer,

U.S. Department of Energy, National Energy Technology Laboratory

M. Mercedes Maroto-Valer, and John M. Andréen, *The Energy Institute, The Pennsylvania State University*

Michael V. Ciocco, and Paul H. Zandhuis, *Parsons Project Service, Inc.*

Improving Combustion Efficiency in Utility Boilers - A UK Perspective

Phil Cahill, Martin O'Connor, and Gerry Riley, *Innogy plc*

Presenter: Andrew Hebbs

Project CONDOR: MultiMedia MultiPollutant Initiative

Mildred Perry, Gerst Gibbon, and Dennis Smith

U.S. Department of Energy, National Energy Technology Laboratory

